

Applic. No.: 10/666,228

Amdt. Dated December 30, 2005

Reply to Office action of October 4, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claim 1 (currently amended). A power transistor having at least one trench transistor cell in a semiconductor body, comprising:

a drain zone, a drift zone, a channel zone, and a source zone formed in each case successively and substantially horizontally in the semiconductor body;

the semiconductor body having a trench formed therein with a base and a defined body height opposite a pn junction between said drift zone and said channel zone;

a first dielectric layer cladding said trench substantially to said body height, and a gate oxide cladding said trench between said body zone and a semiconductor body surface; and

a field electrode extending in said trench substantially from said trench base to an upper edge of said first dielectric layer, said field electrode being connected to be at a fixed potential or at a source potential;

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a gate electrode disposed substantially between said body height and the semiconductor body surface, said gate electrode being electrically insulated from the semiconductor body by said gate oxide and having a lower edge with a profile, said profile ~~being at least partly obliquely angled relative to the semiconductor body surface and/or~~ having a horseshoe shape with two jaws projecting at edges thereof and a center between said jaws having an inward bulge in which said field electrode enters beyond said pn junction; and

a second dielectric layer formed between said gate electrode and said field electrode.

Claims 2-4 (cancelled).

Claim 5 (original). The power transistor according to claim 1, wherein said field electrode overlaps said gate electrode.

Claim 6 (currently amended). The power transistor according to claim [[5]] 1, wherein at least one of said field electrode and said gate electrode intersects and/or passes through a plane defined by said pn junction between said drift zone and said channel zone.

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Claims 7-8 (cancelled).

Claim 9 (new). A power transistor having at least one trench transistor cell in a semiconductor body, comprising:

a drain zone, a drift zone, a channel zone, and a source zone formed in each case successively and substantially horizontally in the semiconductor body;

the semiconductor body having a trench formed therein with a base and a defined body height opposite a pn junction between said drift zone and said channel zone;

a first dielectric layer cladding said trench substantially to said body height, and a gate oxide cladding said trench between said body zone and a semiconductor body surface; and

a field electrode extending in said trench substantially from said trench base to an upper edge of said first dielectric layer, said field electrode being connected to be at a fixed potential or at a source potential;

a gate electrode disposed substantially between said body height and the semiconductor body surface, said gate electrode being electrically insulated from the semiconductor body by

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said gate oxide and having a lower edge with a profile, said profile being at least partly obliquely angled relative to the semiconductor body surface, and said lower edge being provided above a top surface of said field electrode; and

a second dielectric layer formed between said gate electrode and said field electrode.

Claim 10 (new). The power transistor according to claim 9, wherein at least one of said field electrode and said gate electrode intersects and/or passes through a plane defined by said pn junction between said drift zone and said channel zone.

Claim 11 (new). A power transistor having at least one trench transistor cell in a semiconductor body, comprising:

a drain zone, a drift zone, a channel zone, and a source zone formed in each case successively and substantially horizontally in the semiconductor body;

the semiconductor body having a trench formed therein with a base and a defined body height opposite a pn junction between said drift zone and said channel zone;

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a first dielectric layer cladding said trench substantially to said body height, and a gate oxide cladding said trench between said body zone and a semiconductor body surface; and

a field electrode extending in said trench substantially from said trench base to an upper edge of said first dielectric layer, said field electrode being connected to be at a fixed potential or at a source potential;

a gate electrode disposed substantially between said body height and the semiconductor body surface, said gate electrode being electrically insulated from the semiconductor body by said gate oxide and having a lower edge with a profile, said profile having a horseshoe shape with two jaws projecting at edges thereof and a center between said jaws having an inward bulge in which said field electrode enters, outer edges of said jaws being at least partly obliquely angled relative to the semiconductor body surface; and

a second dielectric layer formed between said gate electrode and said field electrode.

Claim 12 (new). The power transistor according to claim 11, wherein said field electrode overlaps said gate electrode.

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Claim 13 (new). The power transistor according to claim 11, wherein at least one of said field electrode and said gate electrode intersects and/or passes through a plane defined by said pn junction between said drift zone and said channel zone.